mobile station at the initial transmission power value **22**, and compares the measured value with an up reference reception level by a transmission power value determining unit **20**. The transmission power value determining unit **20** determines the up transmission power value of the mobile station so that the measured value (reception level of the up-line) converges to the up reference reception level, and notifies the determined up transmission power value to the mobile station.

In response to this notification, the mobile station sets the notified up transmission power value as an up transmission power **18'**, and makes the call at this up transmission power **18'**. Thereafter, until the call is terminated, the mobile station successively controls the up transmission power based on the reception level of the up-line successively notified from the base station, so that the notified reception level of the up-line converges to the up-line reference level.

Next, a description will be given of a case where the mobile station is called from the fixed network or the like, by referring to FIGS. **4** and **7**. When a call is received from the fixed network or the like, a call request is notified from the base station to the mobile station. When the mobile station receives this call request as a receive request, the mobile station sends a called radio state report having a format shown in FIG. **11** to the base station. This called radio state report includes the reception levels of the own zone and the peripheral zone measured during the standby mode and stored in the measured data storage **9**, and the mobile station type **11** having the format shown in FIG. **9**. In addition, a transmission power **12** at the time when the mobile station sends the called radio state report is controlled by the autonomous transmission power controller **10**, similarly as described above. In other words, the autonomous transmission power controller **10** compares the reception level of the own zone measured in the standby mode with a predetermined threshold value, and controls the transmission power **12** so as to reduce the magnitude thereof if the measured reception level is greater than the predetermined threshold value.

The operations of controlling the up transmission power and the down transmission power after the base station receives the called radio state report are the same as those of the mobile station at the time of the calling shown in FIGS. **3** and **6**.

Conventionally, the initial transmission power value, which is the transmission power immediately after the call is started, is a predetermined fixed value for both the up-line and the down-line. For this reason, if the initial transmission power value is determined to a high fixed value by taking as the reference a mobile station which is located near the edge of the zone, the mobile station near the base station will transmit at the high transmission power immediately after the call is started for both the up-line and the down-line. The initial transmission power is controlled to eventually converge to a suitable value, however, in the case of the mobile station near the base station, the transmission is made at the high transmission power until the transmission power is reduced to the suitable value, and there is a possibility of interfering the communication in another zone.

In addition, the maximum transmission power (for example, 3 W in the case of a 3 W mobile station) at which the transmission can be made differs depending on the individual mobile station. Hence, it is difficult to determine an optimum initial transmission power for all of the mobile stations.

SUMMARY OF THE INVENTION

Accordingly, it is a general object of the present invention to provide a novel and useful method of determining initial transmission power, in which the problems described above are eliminated.

Another and more specific object of the present invention is to provide a method of determining an initial transmission power in a mobile communication system having a base station and at least one mobile station, comprising the steps of (a) measuring at the mobile station a reception level of a down control channel from the base station, and (b) determining an initial transmission power value of a down talk channel of the base station based on the reception level measured in said step (a). According to the method of the present invention, the initial transmission power is determined to an optimum value from the start for each mobile station, where the initial transmission power refers to the transmission power of the mobile station and the base station after the call starts and until the transmission power is controlled to the optimum value. For this reason, it is possible to prevent interference of the communication in another zone due to unnecessarily high transmission power, and it is possible to build a communication system having a high reliability. In addition, it is possible to reduce the power consumption because the use of unnecessarily high transmission power is prevented.

Still another object of the present invention is to provide a method of determining an initial transmission power in a mobile communication system having a base station and at least one mobile station, comprising the steps of (a) measuring at the mobile station a reception level of a down control channel from the base station and reporting the measured reception level to the base station, and (b) obtaining a comparison result by comparing at the base station the reception level of the down control channel with a threshold valve which is used to determine an initial transmission power value of a down talk channel, and determining the initial transmission power value of the down talk channel based on the comparison result. According to the method of the present invention, the initial transmission power is determined to an optimum value from the start for each mobile station, where the initial transmission power refers to the transmission power of the mobile station and the base station after the call starts and until the transmission power is controlled to the optimum value. For this reason, it is possible to prevent interference of the communication in another zone due to unnecessarily high transmission power, and it is possible to build a communication system having a high reliability. In addition, it is possible to reduce the power consumption because the use of unnecessarily high transmission power is prevented.

A further object of the present invention is to provide a method of determining an initial transmission power in a mobile communication system having a base station and at least one mobile station, comprising the steps of (a) measuring at the mobile station a reception level of a down control channel from the base station and reporting to the base station a comparison result which is obtained by comparing the measured reception level with a threshold value which is used to determine an initial transmission power value of a down talk channel, and (b) determining at the base station the initial transmission power value of the down talk channel based on the comparison result reported from the mobile station. According to the method of the present invention, the initial transmission power is determined to an optimum value from the start for each mobile station, where the initial transmission power refers to the transmission power of the mobile station and the base station after the call starts and until the transmission power is controlled to the optimum value. For this reason, it is